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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/803,527 | 03/17/2004 | David A. Litton | EH-10433B(02-217-2) | 5484 |
| 34704 | 7590 | 05/26/2006 | EXAMINER | |
| BACHMAN & LAPOINTE, P.C. 900 CHAPEL STREET SUITE 1201 NEW HAVEN, CT 06510 | | | IVEY, ELIZABETH D | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1775 | |

DATE MAILED: 05/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/803,527 | Applicant(s) LITTON ET AL. | |
| | Examiner Elizabeth Ivey | Art Unit 1775 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION:

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
- 2a) ☐ This action is **FINAL**.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-10, 14-30, 33 and 35-55 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-20, 22-30 and 35-44 is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-10, 14-17, 21, 33 and 45-55 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some * c) ☐ None of:
 - 1. ☐ Certified copies of the priority documents have been received.
 - 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 21 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 21 claims a lanthanide sesquioxide in an amount from .001 to 40 mol% and depends from claim 18 which claims a lanthanide sesquioxide in an amount of at least 15% rendering .001 up to 15% outside the claimed range.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 1775

Claim 46 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,844,075 to Saak et al.

Regarding claim 46, Saak discloses an intermediate layer (bond coat) for a coating system on a turbine component. The substrate may comprise a ceramic matrix composite, and the intermediate coating comprises tantalum oxide (column 3 lines 13-15 and claim 5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

Art Unit: 1775

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5 and 8-10, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,025,078 to Rickerby et al. in view of U.S. Patent 6,258,467 to Subramanian et al. further in view of U.S. Patent 6,607,852 to Spitsberg et al.

Regarding claims 1-2, 4 and 8-10, Rickerby discloses a thermal barrier coating for a superalloy turbine component, said thermal barrier comprising ceria and 4-25mol% of erbia or neodymia or dysprosia or europia or gadolinia or praseodymia or ytterbia (all sesquioxides) (column 4 lines 43-57). The term "balance" is not considered closed language and allows for presence of other than the claimed components. Rickerby does not disclose a ceramic substrate but Spitsberg discloses both monolithic and composite ceramic substrates are used for turbine components having lanthanide-containing oxide thermal barrier coatings (column 5 lines 3-9). Additionally, Subramanian discloses superalloy and ceramic substrates used interchangeably as substrates for turbine engine components with lanthanide-containing oxide coatings (column 1 lines 16-17). Therefore it would have been obvious to a person having ordinary skill in the art at the time of the invention to use either a monolithic or a composite ceramic substrate with the coatings of Rickerby.

Regarding claims 3 and 5, Spitsberg discloses the ceramic substrate may be silicon nitride or a SiC-SiC composite (column 5 lines 3-9 and 24-29).

Claims 45, 47-48 and 54-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,025,078 to Rickerby et al. in view of U.S. Patent 6,258,467 to Subramanian et al. further in view of U.S. Patent 6,607,852 to Spitsberg et al. as applied to claim 1 and further in view of U.S. Patent Application 20030138641A1 to Fukudome et al.

Regarding claims 45, 47-48 and 54-55, Rickerby, Subramanian and Spitsberg disclose all of the limitations of claim 1 and disclose a bond coat, but do not expressly disclose the bond coat as rare earth disilicates or a plurality of layers or functionally graded layers. However, Fukudome discloses a ceramic substrate used for turbine engines employing any rare earth disilicate including yttrium as an intermediate layer (bond coat) between the substrate and the surface protection layer. Fukudome discloses this layer may be a plurality of layers or graded layers and is arranged to reduce the stress caused by differences in thermal expansion coefficients and to prevent peeling of the surface protection layer. (page 2 paragraphs [0018] and [0021]-[0022]). Therefore it would have been obvious to a person having ordinary skill in the art at the time of the invention to use said layers as disclosed by Fukudome as the bondcoat in Rickerby, Subramanian and Spitsberg to reduce the stress caused by differences in thermal expansion coefficients and to prevent peeling of the surface protection layer. Although Fukudome does not expressly disclose the oxidation resistance and corrosion resistance, a chemical composition and its properties are inseparable. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 MPEP 2112.01. because the prior art exemplifies the applicant's claimed composition in relation to the bond coat layer, the claimed physical properties relating to the

Art Unit: 1775

oxidation resistance and corrosion resistance are inherently present in the prior art. Absent an objective evidentiary showing to the contrary, the addition of the claimed physical property to the claim language fails to provide patentable distinction over the prior art.

Claims 45 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,025,078 to Rickerby et al. in view of U.S. Patent 6,258,467 to Subramanian et al. further in view of U.S. Patent 6,607,852 to Spitsberg et al. as applied to claim 1 and further in view of U.S. Patent 5,985,470 to Spitsberg et al.

Regarding claims 45 and 50, Rickerby, Subramanian and Spitsberg ('852) disclose all of the limitations of claim 1 and disclose a bond coat, but do not expressly disclose the bond coat as a barium strontium aluminosilicate (BSAS). However, Spitsberg ('470) discloses a ceramic substrate for a turbine engine component with a thermal barrier coating and a BSAS bond coat, which helps to bond the thermal barrier to the substrate particularly for Si-containing substrates (column 2 lines 27-44). Therefore it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the BSAS bond coat of Spitsberg ('470) as the bond coat with the combined disclosure of Rickerby, Subramanian and Spitsberg ('852). Although Spitsberg ('470) does not expressly disclose the coefficient of thermal expansion matching, the oxidation resistance and corrosion resistance, a chemical composition and its properties are inseparable. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 MPEP 2112.01. Because the prior art exemplifies the applicant's claimed composition in relation to the bond coat layer, the claimed physical properties relating to the thermal expansion matching, the oxidation

Art Unit: 1775

resistance and corrosion resistance are inherently present in the prior art. Absent an objective evidentiary showing to the contrary, the addition of the claimed physical property to the claim language fails to provide patentable distinction over the prior art.

Claims 45 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,025,078 to Rickerby et al. in view of U.S. Patent 6,258,467 to Subramanian et al. further in view of U.S. Patent 6,607,852 to Spitsberg et al. as applied to claim 1 and further in view of U.S. Patent Application 2002/0028941 to Lane et al.

Regarding claims 45 and 49, Rickerby, Subramanian and Spitsberg ('852) disclose all of the limitations of claim 1 and disclose a bond coat, but do not expressly disclose the bond coat as a mullite. However, Lane discloses a ceramic substrate for a turbine engine component with a thermal barrier coating and a mullite coat (bond coat), which provides an oxygen barrier to the substrate (page 1 paragraphs [0002], [0006] and [0008]). Therefore it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the mullite oxygen barrier of Lane as the bond coat with the combined disclosure of Rickerby, Subramanian and Spitsberg ('852) to provide an oxygen barrier to the ceramic substrate. Additionally, a chemical composition and its properties are inseparable. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 MPEP 2112.01. Because the prior art exemplifies the applicant's claimed composition in relation to the bond coat layer, the claimed physical properties relating to the thermal expansion matching, and corrosion resistance are inherently present in the prior art. Absent an objective evidentiary showing to the contrary, the addition of the claimed physical property to the claim language fails to provide patentable distinction over the prior art.

Claims 45, 49 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,025,078 to Rickerby et al. in view of U.S. Patent 6,258,467 to Subramanian et al. further in view of U.S. Patent 6,607,852 to Spitsberg et al. as applied to claim 1 and further in view of U.S. Patent 5,863,668 to Brindley et al.

Regarding claims 45, 49 and 51, Rickerby, Subramanian and Spitsberg ('852) disclose all of the limitations of claim 1 and disclose a bond coat, but do not expressly disclose the bond coat as a mullite. However, Brindley discloses a turbine engine component with a thermal barrier with a bond coat comprising yttrium aluminum garnet (YAG) or a mullite, providing modified thermal expansion coefficients for enhanced thermal fatigue life (column 2 lines 38-43 and 51-61). Therefore it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the YAG or mullite bond coat of Brindley as the bond coat with the combined disclosure of Rickerby, Subramanian and Spitsberg ('852) to provide enhanced thermal fatigue life. Additionally, a chemical composition and its properties are inseparable. In *re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 MPEP 2112.01. Because the prior art exemplifies the applicant's claimed composition in relation to the bond coat layer, the claimed physical properties relating to the thermal expansion matching, and corrosion resistance are inherently present in the prior art. Absent an objective evidentiary showing to the contrary, the addition of the claimed physical property to the claim language fails to provide patentable distinction over the prior art.

Art Unit: 1775

Claims 45, 51, 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,025,078 to Rickerby et al. in view of U.S. Patent 6,258,467 to Subramanian et al. further in view of U.S. Patent 6,607,852 to Spitsberg et al. as applied to claim 1 and further in view of U.S. Patent 5,572,725 to Morris et al.

Regarding claims 45, 51, 52 and 53, Rickerby, Subramanian and Spitsberg ('852) disclose all of the limitations of claim 1 and disclose a bond coat, but do not expressly disclose the bond coat as a Y, Yb, Gd, Tb, Dy, Ho, Er, Tm, Lu, aluminum garnet or mixtures thereof. However, Morris discloses a turbine engine component with a substrate with an epitaxially grown fiber coating comprising Y, Yb, Gd, Tb, Dy, Ho, Er, Tm, Lu, aluminum garnet, providing high strength, oxidation and creep resistance to the substrate (column 2 lines 8-16). Therefore it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the Y, Yb, Gd, Tb, Dy, Ho, Er, Tm, Lu, aluminum garnet coat of Morris as the bond coat with the combined disclosure of Rickerby, Subramanian and Spitsberg ('852) to provide high strength, oxidation and creep resistance to the substrate. Additionally, a chemical composition and its properties are inseparable. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 MPEP 2112.01. Because the prior art exemplifies the applicant's claimed composition in relation to the bond coat layer, the claimed physical properties relating to the thermal expansion matching, and corrosion resistance are inherently present in the prior art. Absent an objective evidentiary showing to the contrary, the addition of the claimed physical property to the claim language fails to provide patentable distinction over the prior art.

Allowable Subject Matter

Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 18-20, 22-30, 33 and 35-44 are allowed.

Response to Arguments

Examiner acknowledges amendments to claims 1, 14, 18, 22, 25, 28, 30, 33, 35, 36, 38, 39, 40, 41, 42, and 46 and cancellation of claims 31-32 and 34.

Examiner withdraws objections to claims 1 and 36 and 112 2nd paragraph rejections to claims 14, 18 and 28 and asserts new objection to claim 21.

Applicant's arguments regarding claim 46 filed March 15, 2006 have been fully considered but they are not persuasive. Saak does in fact anticipate the claim because Saak discloses an intermediate coat formed by tantalum as indicated above.

Art Unit: 1775

Applicant's arguments, with respect to claims 22-24, 35 have been fully considered and are persuasive. The 103 rejections of claims 22-24 and 35 have been withdrawn.

Upon further review of the art, additional rejections have been applied to the pending claims.

Applicant's arguments with respect to claims 25, 26, 28, 30, 33 have been considered but are moot in view of the new ground(s) of rejection.

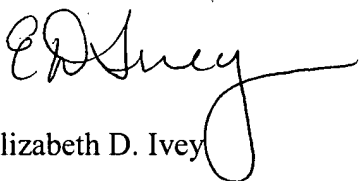
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Ivey whose telephone number is (571) 272-8432. The examiner can normally be reached on 7:00- 4:30 M-Th and 7:00-3:30 alt. Fridays.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1775

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Elizabeth D. Ivey



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5/24/06